1: J Invest Dermatol. 1992 Sep;99(3):283-8.

Short-term retinoic acid treatment increases in vivo, but decreases in vitro, epidermal transglutaminase-K enzyme activity and immunoreactivity.

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Epidermal transglutaminase-K is believed to catalyze the covalent linking of loricrin and involucrin to form cross-linked (CE) envelopes. In normal skin, transglutaminase-K is expressed as a band immediately below the stratum corneum, whereas in psoriasis and healing skin its expression is considerably expanded throughout the suprabasal layers. We have investigated whether the hyperproliferative state induced by short-term application of topical retinoic acid is similarly characterized by an increase in transglutaminase-K enzyme activity and immunoreactivity. Retinoic acid (0.1% cream) or vehicle were applied to human skin and occluded for 4 d. Skin biopsies were obtained for measurement of transglutaminase-K and transglutaminase-C activity and immunoreactivity. For comparison, cultured normal human keratinocytes were incubated for 4 d in the presence of 1 microM retinoic acid and the subsequent transglutaminase-K activity and immunoreactivity measured. Transglutaminase-K activity was increased 2.8 times in retinoic acid compared to vehicle-treated skin (p less than 0.005, n = 12) whereas there was no significant difference in transglutaminase-C activity. However, transglutaminase-K mRNA levels were not significantly different between retinoic acid- and vehicle-treated skin. In vehicle-treated skin, transglutaminase-K immunoreactivity was limited to a narrow, substratum corneal band, but was considerably expanded in a diffuse suprabasal pattern in retinoic acid-treated epidermis. In contrast, transglutaminase-K immunostaining was decreased and its enzymatic activity reduced sixfold in retinoic acid-treated keratinocytes (p less than 0.01, n = 4). These results demonstrate that retinoic acid treatment in vivo, in contrast to in vitro, leads to not only increased transglutaminase-K protein expression but also increased enzymatic activity in the absence of detectable increases in mRNA levels. These data, taken with the previously reported lack of in vivo modulation of the differentiation markers keratins 1 and 10 by retinoic acid, indicate that certain aspects of keratinocyte terminal differentiation that are altered in vitro by retinoic acid do not occur in vivo in human skin.

Publication Types:
- Clinical Trial
- Randomized Controlled Trial

PMID: 1355099 [PubMed - indexed for MEDLINE]